

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
9 October 2003 (09.10.2003)

PCT

(10) International Publication Number
WO 03/082416 A1

(51) International Patent Classification⁷: **A63C 5/00**

(21) International Application Number: **PCT/KR02/02328**

(22) International Filing Date:
10 December 2002 (10.12.2002)

(25) Filing Language: **Korean**

(26) Publication Language: **English**

(30) Priority Data:
20-2002-0009500 29 March 2002 (29.03.2002) **KR**

(71) Applicant and

(72) Inventor: **YUN-KI, Bae** [KR/KR]; 114-104, Samsung Apt., Namgajwa-dong, Seodaemun-gu, 120-762 Seoul (KR).

(74) Agent: **MYUNG-GUN, Shin**; E-LAND plaza 3F, 268-2, Seohyeon-dong, Bundang-gu, Seongnam-si, 463-824 Gyeonggi-do (KR).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

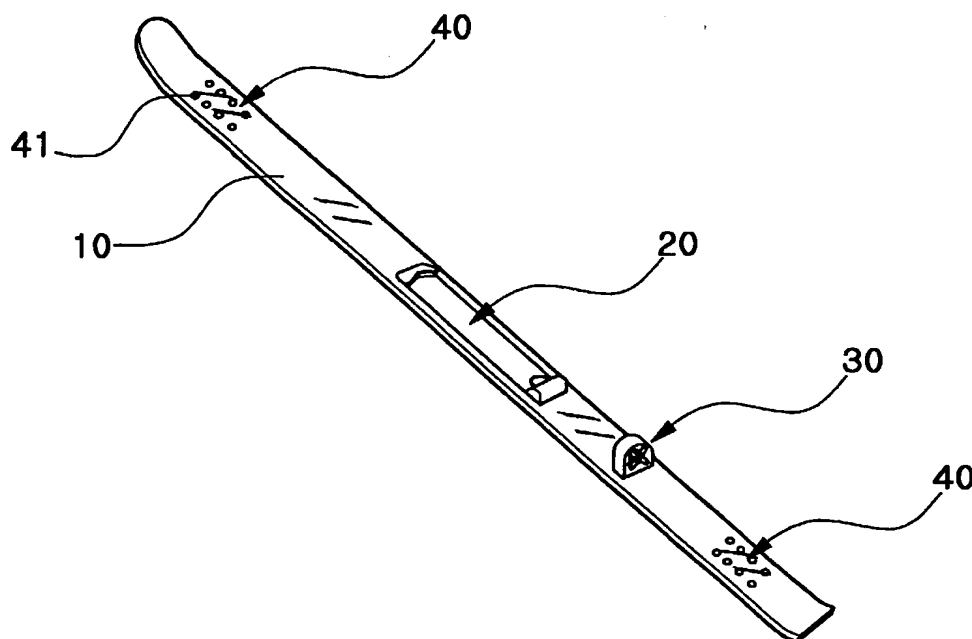
(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **LUMINESCENT SKI**



(57) Abstract: The present invention relates to the luminescent ski having the permanent magnet rotated by the movement of ski and induction coil located in the around of the permanent magnet, wherein, the rotation of the permanent magnet generate the induction current on the induction coil, and, this induction current is the electric source of the luminescent ski.

1

Luminescent Ski**Technical Field**

5 The present invention relates to the luminescent ski having the permanent magnet rotated by the movement of ski and induction coil located around the permanent magnet, wherein, the rotation of the permanent magnet generate the induction current on the induction coil, and this induction current is the electric source of the luminescent ski.

10 **Background Art**

 Generally, a ski slides at a high speed, and a skier wears a bright color ski clothes and a goggle for implementing a certain field of vision for thereby preventing a certain crash accident.

15 However, when a user plays skiing at night, since a skin gear is not recognized at night, an accident may be increased. Even when a safety staff standbys, it is impossible to prevent an accident.

Disclosure of Invention

20 Overcoming the above problems encountered in the conventional art, the object of

2

the present invention is to provide a luminescent ski which is implementing a certain decoration effect and which is easily recognized at night by providing a luminescent unit.

It is another object of the present invention to provide a luminescent ski which
5 does not need an additional operation such a switch operation or a battery exchange that a luminescent unit is blinked using a current which is generated by a movement of a ski.

In order to achieve the above objects of the present invention, in a ski formed of a plate and a binding, a luminescent ski, comprising: a permanent magnet which is rotatably installed in an upper portion of the plate by a rotation wing having the same rotary shaft;
10 an induction coil which is fixedly installed in a surrounding portion of the permanent magnet; and a luminescent unit with a light emitting diode which is connected with an extension of the induction coil, wherein the permanent magnet and the induction coil are detachable in the interior of the binding or to a rear surface of the same.

In order to achieve another object of the present invention, the luminescent unit
15 includes a plurality of transmission windows through which a light of the light emitting diode transmits to the outside.

Brief Description of the Drawings

20 The present invention will become better understood with reference to the

3

accompanying drawings which are given only as one of illustration and thus are not limitative of the present invention, wherein;

Figure 1 is a perspective diagram illustrating a luminescent ski according to an embodiment of the present invention;

5 Figure 2 is a perspective diagram illustrating a generator according to the present invention;

Figure 3 is a vertical cross sectional diagram of Figure 2 according to the present invention; and

Figure 4 is a diagram illustrating the construction of the permanent magnet
10 according to the present invention.

<Descriptions of reference numerals of major elements of the drawings>

10: plate

20: binding

30: generator

31: housing

15 32: rotation wing

33: rotary shaft

33a: engaging shoulder

33b: bearing

34: permanent magnet

35: induction coil

36: protection member

40: luminescent unit

41: transmission window

Preferred Embodiment

The preferred embodiments of a luminescent ski according to the present invention will be described with reference to the accompanying drawings.

5 Figure 1 is a perspective diagram illustrating a luminescent ski according to the present invention, and Figures 2 and 3 are diagrams illustrating a generator of a luminescent ski.

The luminescent ski is formed of plates (10), bindings (20) and luminescent unit. The above luminescent part is formed of a generation unit (30) and a luminescent unit (40).

10 The generation unit (30) is formed of a housing (31), a rotation wing (32), a rotary shaft (33), a permanent magnet(34) and an induction coil(35).

The housing(31) is a body in which the rotary shaft(33), the permanent magnet(34) and the induction coil(35) are supported and installed. A protection member (36) which is engaged to the plate (10) and is preferably provided behind a binding (20) is
15 formed in a surrounding portion of the housing (31) and the rotation wing (32) for protecting the rotation wing (32).

In addition, the housing (31) is detachable in the interior or to a rear portion of the plate (10).

The rotation wing (32) is provided in an end outer surface of the rotary shaft (33)
20 and is rotated by wind, and a plate or a propeller-shaped wing which is slanted in a certain

5

direction is formed in an outer surface of the rotary shaft (33) in a radial direction.

The rotary shaft (33) forms a rotation center axis of the rotation wing (32) and passes through one side of the housing (31) in parallel and is engaged with the permanent magnet (34) in the interior of the housing (31). In addition, as shown in Figure 3, an engaging shoulder(33a) is formed in an outer surface of the housing(31) in order for the rotary shaft(33) to be moved in an inner direction or outer direction of the housing(31). In addition, a bearing (33b) is installed for implementing a smooth operation of the rotary shaft(33).

The permanent magnet (34) is vertically installed in the interior of the housing (31) in such a manner that the permanent magnet (34) is rotatable about a center axis of the rotary shaft (33). As shown in Figure 4, A N-pole and S-pole are alternately formed in an same outer surface, and a through hole engaged with the rotary shaft(33) is formed in a same inner surface for thereby forming a circular shape. At this time, a rotational force of the rotation wing (32) is transferred as a result of a rotation force of the permanent magnet(34) through the rotary shaft(33).

The induction coil (35) is installed in the interior of the housing(31) fixedly with a certain width from the permanent magnet(34) and generates an induction current by an induction electromotive force which is generated by a variation of a magnetic force by a rotation movement of the permanent magnet (34).

The luminescent unit (40) is formed of a plurality of light emitting diodes which

6

are installed in an upper surface of the plate(10) for being connected with the induction coil(35) extended to the outside of the housing(31) and which are blinked by an induction current applied from the induction coil(35). Preferably, a transmission window(41) is provided in an upper surface of the plate(10) so that the light of the light
5 emitting diode is transmitted to the outside. In the embodiment of the present invention, a plurality of circular transmission windows(41) are provided in an upper surface of the plate(10), and the light emitting diodes are installed in the interior of the transmission window(41).

The luminescent unit(40) may be formed of a plurality of light emitting diodes
10 which emit various color light or may be formed in such a manner that the transmission window(41) generates various colors for thereby enhancing a visional effect.

A reflection plate may be installed in a lower portion of the light emitting diode, so that the luminescent unit is more visible by a blinking operation of the light emitting diodes.

15 The luminescent operation of the luminescent ski according to the present invention will be described below.

When a user skies on a slope, wearing a luminescent ski, the rotation wing(32) of the generator(30) is rotated by wind, and a driving force of the rotation wing(32) is transferred to the permanent magnet(34) through the rotary shaft(33), and the rotation wing
20 (32) and the permanent magnet(34) are rotated together.

7

As the permanent magnet(34) is rotated, an induction current is generated in the induction coil(35) by a variation of the magnetic force of the N-pole and S-pole alternately formed in an outer surface of the permanent magnet(34). The thusly generated induction current is applied to the light emitting diode connected with an extension of the
5 induction coil(35), so that the light emitting diodes are lighted.

As the present invention may be embodied in several forms without departing from the spirit or essential characteristics thereof, it should also be understood that the above-described examples are not limited by any of the details of the foregoing description, unless otherwise specified, but rather should be construed broadly within its spirit and
10 scope as defined in the appended claims, and therefore all changes and modifications that fall within the meets and bounds of the claims, or equivalences of such meets and bounds are therefore intended to be embraced by the appended claims.

Industrial Applicability

15

As described above, in the present invention, a luminescent unit is provided in a ski for thereby implementing a certain visible decoration effect and preventing a possible crash accident with a good recognition at night. It is possible to recognize boots and skin at night.

8

In addition, in the present invention, the luminescent unit of a ski is blinked by a sliding operation of ski without providing an additional power apparatus such as a battery, etc. and without operating a switch, so that it is convenient to use.

What is claimed is:

1. In a ski formed of a plate and a binding, luminescent ski, comprising:

a permanent magnet which is rotatably installed in an upper portion of the plate by

5 a rotation wing having the same rotary shaft;

an induction coil which is fixedly installed in a surrounding portion of the permanent magnet; and

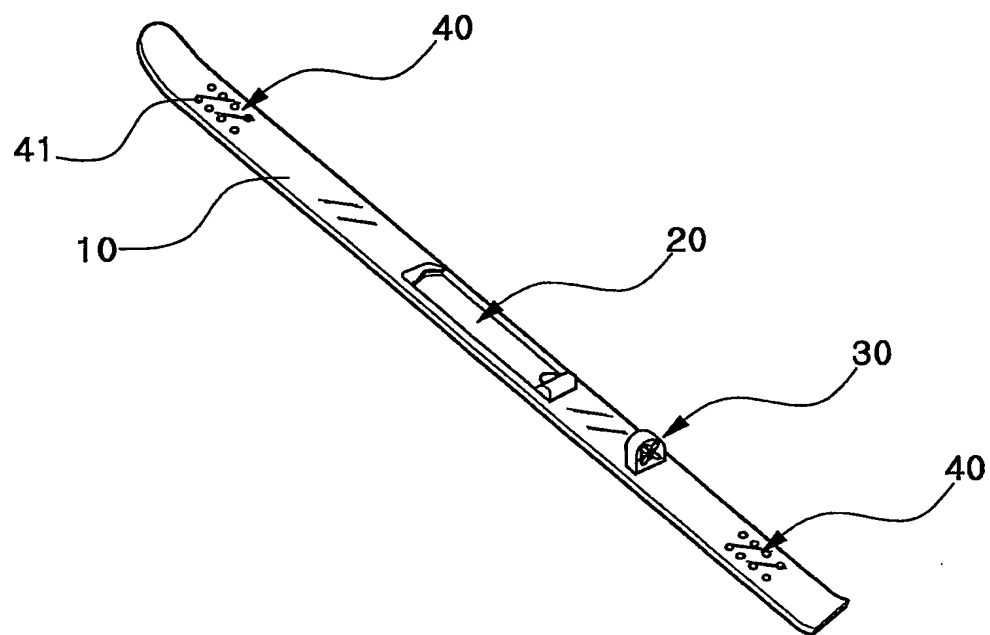
a luminescent unit with a light emitting diode which is connected with an extension of the induction coil.

10

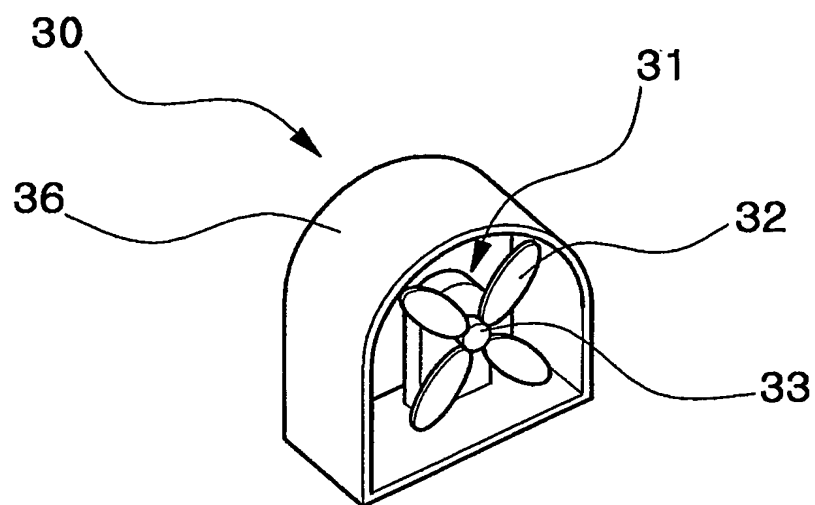
2. The luminescent ski as recited in claim 1, wherein the luminescent unit includes a plurality of transmission windows through which a light of the luminescent diode transmits to the outside.

【Drawing】

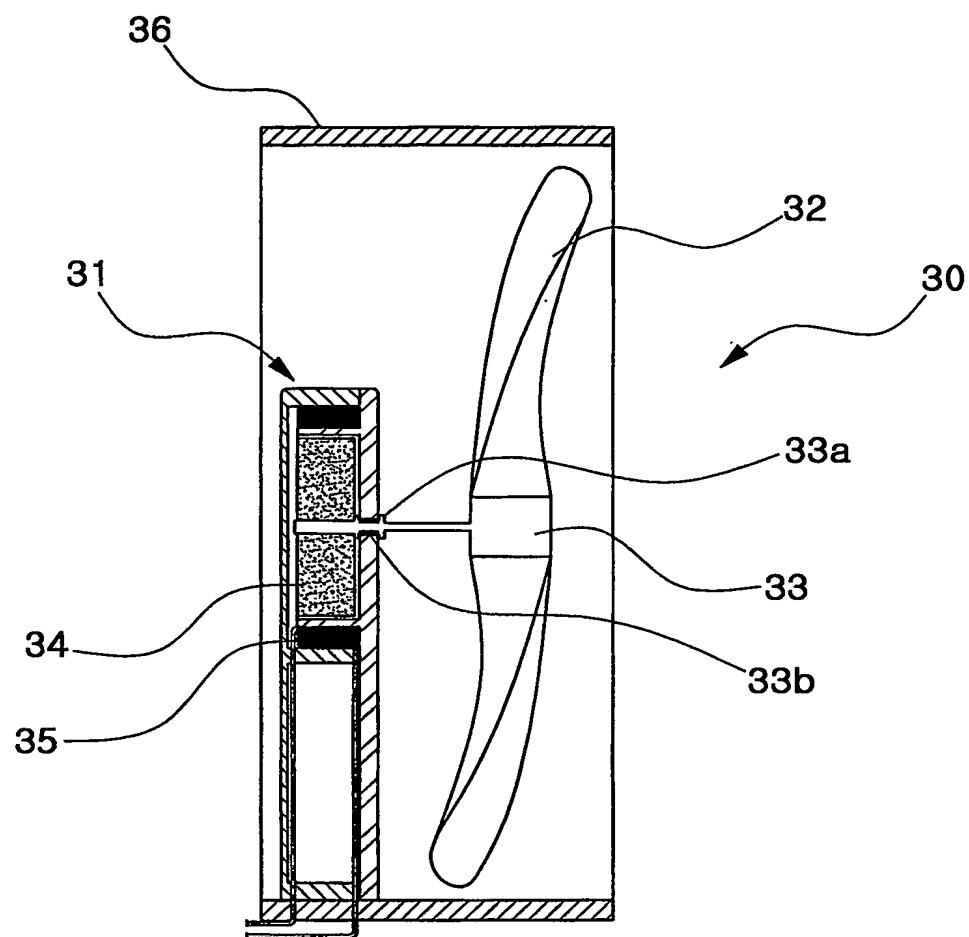
【Figure 1】



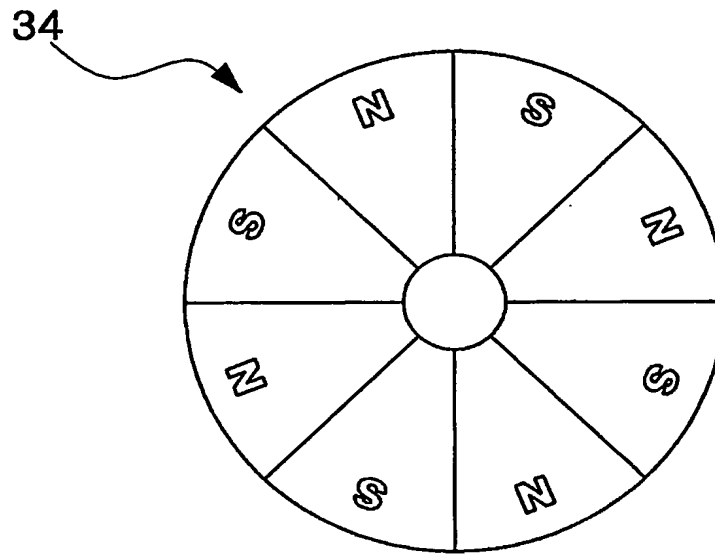
【Figure 2】



【Figure 3】



【Figure 4】



INTERNATIONAL SEARCH REPORT

national application No.
PCT/KR02/02328

A. CLASSIFICATION OF SUBJECT MATTER**IPC7 A63C 5/00**

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7 A63C 5/00-17/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

KR, JP:classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KR20-220530Y(Lee Du Heong) 02 FEBRUARY 2001 See the whole document	1-2
Y	KR20-0210571Y (Choi chung duk) 06 NOVEMBER 2000 See the whole document	1-2
Y	JP60-149673 U (KAWAHAN SHONKEN) 4 OCTOBER 1985 See the whole document	1-2
A	JP05-177027 A(TAKAHASHI TOSHIKO)20 JULY 1993 See the whole document	1-2

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family


Date of the actual completion of the international search

12 MARCH 2003 (12.03.2003)

Date of mailing of the international search report

13 MARCH 2003 (13.03.2003)

Name and mailing address of the ISA/KR

 Korean Intellectual Property Office
920 Dunsan-dong, Seo-gu, Daejeon 302-701,
Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

KANG, Jung Seok

Telephone No. 82-42-481-5450

